Remarks

Introduction

Applicants have canceled claims 1-62 and added new claims 63-112.

In the final Office Action dated June 3, 2004, the Examiner rejected various claims over U.S. Patent No. 5,155,019 to Sussman et al. ("Sussman"), in view of U.S. Patent No. 3,831,030 to Wrobel et al. ("Wrobel"), and further in view of one or more tertiary references, including EP application 0448923 to Fraatz et al. ("Fraatz"), U.S. Patent No. 5,888,825 to Carr et al. ("Carr"), U.S. Patent No. 5,518,923 to Berndt et al. ("Berndt"), U.S. Patent No. 4,952,498 to Waters ("Waters"), and U.S. Patent No. 5,614,718 to Brace ("Brace").

With respect to new claims 63-112, applicants will primarily address the Sussman and Wrobel references.

The Claims

Independent claim 63 recites a system for detecting the growth of microorganisms in a sample in a container, the system having, among other things, a laser adapted to emit, through the container, radiation at a substantially single wavelength at which O_2 gas absorbs radiation. The system also contains a detector and a signal analyzer, where the signal analyzer determines the pressure in the container, the existence of O_2 gas in the container, and/or the concentration of O_2 gas in the container. Claim 65 recites that the laser emits at a wavelength of approximately 761.5 nanometers.

Independent claim 79 recites a system for detecting the growth of microorganisms in a sample in a container, the system having, among other things, a laser adapted to emit, through the container, radiation at a substantially single wavelength of approximately 2.004 micrometers at which CO_2 gas absorbs radiation. The system also contains a detector and a signal analyzer, where the signal analyzer determines the pressure in the container, the existence of CO_2 gas in the container, and/or the concentration of CO_2 gas in the container.

Independent claim 94 recites a system for detecting the growth of microorganisms in a sample in a container, the system having, among other things, a laser adapted to emit, through said container, radiation at a substantially single

wavelength at which a gas selected from the group consisting of NH_3, H_2S, CH_4 and SO_2 absorbs radiation. The system also contains a detector and a signal analyzer, where the signal analyzer determines the pressure in the container, the existence of said gas in the container, and/or the concentration of said gas in the container. Claim 96 recites that the gas is NH_3 and the wavelength is approximately 1.997 micrometers. Claim 97 recites that the gas is H_2S and the wavelength is approximately 1.570 micrometers. Claim 98 recites that the gas is CH_4 and the wavelength is approximately 1.650 micrometers. Claim 99 recites that the gas is SO_2 and said wavelength is approximately 7.28 micrometers.

The dependent claims recite various other features of the system.

The References

Sussman discloses use of an FT-IR technique to monitor CO_2 presence in a container. The reference discloses that the wavelengths of interest for CO_2 are 2400CM^{-1} to 2300CM^{-1} (i.e., 1/2400 to 1/2300 centimeters), which converts to a range of 4.35 to 4.17 micrometers (Col. 4, line 36). In fact, Sussman focuses on the fact that polymethylpentene containers have a window of transparency at 2349CM^{-1} (which converts to 4.26 micrometers) (Col. 4, lines 61-62).

Wrobel discloses use of a diode laser, operable in the 2 to 6 micrometer range. For analysis of CO_2, Wrobel teaches use of its laser at a wavelength of 4.28 micrometer (Col. 3, line 7).

Discussion

Thus, together, Sussman and Wrobel (if one skilled in the art would have even been motivated to combine them) would have led one skilled in the art to use a wavelength around 4.26 to 4.28 micrometers, in order to analyze for the presence of CO_2. By contrast, applicants' new claim 79 recites use of a wavelength of approximately 2.004 micrometers to analyze for CO_2. There is no suggestion from these references to do so.

As to independent claim 63 and 94, which recite use of a wavelength at which O_2, and NH_3, H_2S, CH_4 or SO_2, respectively, absorb radiation, the combination of Sussman and Wrobel clearly do not lead to any such wavelength selection. This is even more true of dependent claims 65 and 96-99, which recite the specific

wavelengths of such absorption. The other cited references do not lead to a contrary result.

The Examiner has taken the position that, from Fraatz, one skilled in the art would have been motivated to detect gases other than CO_2. Even if one skilled in the art would have been so motivated, such motivation would not have led to the claimed invention, for at least two reasons.

First, if a light absorption technique was tried with such other gases, given the disclosure of Sussman, such a technique would have not used a laser, but instead an FT-IR source such as the Nicolet spectrophotometer disclosed in the Sussman example.

Second, as to use of a laser, it would, at best, have been only obvious to try a laser, which is not a basis for an obviousness rejection. There would have been no reasonable expectation of success in replacing the methods of, e.g., Fraatz, with the type of method claimed by applicants. No one reference suggests or describes such a laser-based system. And, too many variables are relevant, e.g., availability of suitable lasers, availability of lasers with needed wavelengths, absorption peaks for the gases, absorption by the various bottle materials (e.g., sodium in glass), and absorption by the various culture media materials (e.g., water). (See, e.g., Col. 6, lines 27-34 of Sussman.) All these parameters, and more, would have to be aligned perfectly to achieve a feasible invention.

For these reasons, applicants submit that new independent claim 63, 79, and 94, and the claims dependent thereon, are patentable over the cited references.

If there are any additional fees related to this Amendment, such fees should be charged to Deposit Account No. 02-1666.

Respectfully submitted,

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